

PREGNANCY SICKNESS: USING YOUR BODY'S NATURAL DEFENSES TO PROTECT YOUR BABY-TO-BE. By Margie Profet. Reading, MA: Perseus. 1997. 320 pp. ISBN 0-2011-5492-7. \$10.00 (paper).

This is a scientifically oriented but popular book, targeted toward mothers and mothers to be, which discusses a somewhat complicated evolutionary hypothesis. The hypothesis proposes that nausea, vomiting, and food aversions during the first trimester of pregnancy are adaptations to protect the embryo from maternally ingested toxins. Ernest Hook and colleagues in the 1970s (Hook, 1976) first proposed this hypothesis, though Hook's work is not mentioned or cited in the book. Profet first resurrected Hook's hypothesis and evaluated it with a literature review in a scholarly article (Profet, 1992); now she has expanded that review into this popular book.

Profet's main thesis is that plants produce toxins to protect themselves and that women have evolved nausea, vomiting, and food aversions in pregnancy to protect their embryos against these toxins during the most sensitive period of embryonic development (organogenesis) in the first trimester. Nausea, vomiting, and food aversions (collectively referred to as pregnancy-related sickness) are thus made out to be good things to have from a Darwinian perspective. Profet is concerned that mothers to be understand that this is the function of pregnancy-related nausea, vomiting, and food aversions; that is the aim of this book. The first half of the book discusses the science behind the hypothesis: how and why plants produce toxins, how our bodies respond to and protect us from toxins, the effects of toxins on embryos, and the hormones and physiology of pregnancy. The second half of the book provides specific advice on how women can adjust their diet and behavior in the first trimester so that the full benefit of pregnancy-related sickness can be realized.

Profet's book is generally well written and, perhaps unfortunately, reads very convincingly. For many reasons, however, the book is misleading, particularly as a health-advice book. First, it is a health-advice book

on a subject about which precious little is known. Most importantly, the cause(s) of nausea, vomiting, or food aversions in early pregnancy is unknown. We therefore do not know the function, if any, of these symptoms. There has been relatively little research on nausea and vomiting in pregnancy over the years, despite the fact that it is a major form of female morbidity worldwide; most (but not all) women experience nausea and vomiting in one or more pregnancies, and prevalence rates range from 55–90%, depending on the population. Reproductive and other hormones have received a lot of attention, a range of other biological indicators have been investigated as causative or correlated factors, and psychological and immunological explanations have also been put forth over the years (for a review, see Jarnfelt-Samsioe, 1987). But none of this research has made any significant inroads into our understanding of the mechanisms producing the symptoms. The etiological literature is completely inconclusive at present.

The second shortfall with this book is that Profet frequently and curiously misrepresents the research that has been done. She has selected from the literature those pieces that support her framing of the adaptive hypothesis. For example, she favors that estrogen is the most likely cause of nausea, vomiting, and food aversions, but a more likely candidate is human chorionic gonadotropin, as most physicians and a close reading of the literature would suggest. Although Profet provides caveats that the etiology is still obscure, she is nevertheless so convinced that the evolutionary hypothesis is correct that she writes "No other book is an appropriate guide to the first trimester" (p. 14) and "since the function of pregnancy sickness has been elucidated only recently, it is not yet understood by large segments of the medical and lay populations" (p. 114).

Profet has similarly selected from the epidemiological literature those pieces that support her thesis. For instance, this book is specifically about nausea, vomiting, and food aversions as protections against birth defects. However, there is extremely little sup-

port for this connection in the scientific literature. Instead, a large number of epidemiological and clinical studies have reported that these symptoms are linked with early fetal loss; the presence of nausea and vomiting have long been correlated with a lower risk of spontaneous abortion in the first trimester (for a review see Weigel and Weigel, 1989). This common finding has led the medical community to suggest that nausea and vomiting are signs of a healthy pregnancy. The focus on birth defects, about which little is known, to the near dismissal of the seemingly important link with fetal loss, is thus curious.

Another misfocus in the book is the heavy emphasis on plants, to the near exclusion of animal foods, as the most important source of dietary toxins. While we know a fair amount about the effects of human-made toxins on fetal development, little is known about whether there are similar effects from natural plant toxins in our environment. I think that toxins in plant foods are being judged guilty here without a fair trial. There are other suspects to consider; for example, the (admittedly sparse) literature on food aversions in pregnancy strongly implicate animal foods (fish, poultry, beef, mutton, eggs), which are always among the top ten foods pregnant women have aversions to in the first trimester. This might seem to suggest that bacteria and other spoilage products are equally or more important than plant toxins. Profet also effectively ignores food cravings in her book, and I assume this is so because they do not seem to fit well into her evolutionary story. The top food cravings in early pregnancy—fruits, sweets, and carbohydrates—are remarkably, and interestingly, uniform across the cultures that have been studied.

Finally, there is also important and puzzling variation among and within women in nausea and vomiting that is worth thinking and writing about more carefully. For example, a not insignificant number of women do not have nausea and vomiting in a given pregnancy, but they nevertheless seem to have normal, healthy pregnancies. Given this seemingly normal but poorly understood variation, Profet's statement that "A

complete absence of pregnancy sickness during the first trimester should be considered pathological (that is, a malfunction in her mechanisms to trigger pregnancy sickness)" (p. 206) is far too strong and may scare women who have perfectly healthy pregnancies.

It is not likely that the advice and information given in this book will lead to any serious health problems, although some may object to the message "vegetables in early pregnancy may be dangerous," even though Profet is careful to suggest vitamin/mineral supplementation. The book does, however, give incorrect and misleading information to mothers to be who want to understand their bodies during pregnancy and who are trying to do all the right things to ensure the health of their baby to be. And perhaps most seriously, it gives mothers to be yet another reason to be unnecessarily anxious about their pregnancies.

In sum, this book is a good example of both the use of evolutionary science and writing about science for the general public gone astray. Science is still far from any consensus understanding of any aspect of nausea, vomiting, and food aversions in pregnancy; in fact, there are still physicians and researchers who believe these symptoms are purely psychological (if this were the case, then pregnancy-related sickness is the world's most widespread psychiatric disorder). The bright side of all of this is that there is a lot of interesting research that remains to be done, and such work would be of considerable public-health value.

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